

THAT WHICH IS CLAIMED:

5 An isolated polypeptide comprising an amino acid sequence selected from the group consisting of:

- 10 (a) the amino acid sequence shown in SEQ ID NO:1;
- (b) the amino acid sequence encoded by the cDNA contained in ATCC Deposit No. _____;
- (c) the amino acid sequence of an allelic variant of the amino acid sequence shown in SEQ ID NO:1;
- 15 (d) the amino acid sequence of an allelic variant of the amino acid sequence encoded by the cDNA contained in ATCC Deposit No. _____;
- (e) the amino acid sequence of a sequence variant of the amino acid sequence shown in SEQ ID NO:1, wherein the sequence variant is encoded by a nucleic acid molecule hybridizing to the nucleic acid molecule shown in SEQ ID NO:2 under stringent conditions;
- 20 (f) the amino acid sequence of a sequence variant of the amino acid sequence encoded by the cDNA clone contained in ATCC Deposit No. _____, wherein the sequence variant is encoded by a nucleic acid molecule hybridizing under stringent conditions to the cDNA contained in ATCC Deposit No. _____;
- (g) a fragment of the amino acid sequence shown in SEQ ID NO:1, said fragment having sulfatase activity;
- (h) a fragment of the amino acid sequence encoded by the cDNA contained in ATCC Deposit No. _____, wherein the fragment has sulfatase activity;
- 25 (i) the amino acid sequence of the mature sulfatase polypeptide, comprising about amino acid residues 17 to the last amino acid of SEQ ID NO:1;
- (j) the amino acid sequence of the mature polypeptide, comprising from about amino acid 17 to the last amino acid encoded by the cDNA clone contained in ATCC Deposit No. _____;
- 30 (k) the amino acid sequence of an epitope bearing region of a polypeptide of (a)-(j).

2. An isolated antibody that selectively binds to a polypeptide of claim 1.
3. An isolated nucleic acid molecule comprising a nucleotide sequence selected from the group consisting of:
- (a) the nucleotide sequence shown in SEQ ID NO:2;
- (b) the nucleotide sequence in the cDNA contained in ATCC Deposit No. ____;
- (c) a nucleotide sequence encoding the amino acid sequence shown in SEQ ID NO:1;
- (d) a nucleotide sequence encoding the amino acid sequence encoded by the cDNA contained in ATCC Deposit No. ____;
- (e) a nucleotide sequence encoding a polypeptide of claim 1; and
- (f) a nucleotide sequence complementary to a nucleotide sequence of (a)-(e).
4. An isolated nucleic acid molecule comprising a nucleotide sequence selected from the group consisting of:
- (a) a nucleotide sequence encoding a variant of the amino acid sequence shown in SEQ ID NO:1, wherein said nucleotide sequence hybridizes to the nucleotide sequence shown in SEQ ID NO:2 under stringent conditions;
- (b) a nucleotide sequence encoding a variant of the amino acid sequence encoded by the cDNA contained in ATCC Deposit No. ____, wherein the nucleic acid sequence of the sequence variant hybridizes to the cDNA contained in ATCC Deposit No. ____ under stringent conditions;
- (c) a nucleotide sequence encoding the polypeptide of claim 2; and
- (d) a nucleotide sequence complementary to either of the nucleotide sequences in (a)-(c).
5. An isolated nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of:
- (a) a nucleotide sequence encoding a fragment of the amino acid sequence shown in SEQ ID NO:1, wherein the fragment encodes a sulfatase activity;

A

(b) a nucleotide sequence encoding a fragment of the amino acid sequence encoded by the cDNA contained in ATCC Deposit No. _____, wherein the fragment encodes a sulfatase activity;

(c) a nucleotide sequence encoding residues 17 to the last amino acid shown in SEQ ID NO:1;

(d) a nucleotide sequence encoding residues 17 to the last amino acid encoded by the cDNA clone contained in ATCC Deposit No. _____;

(e) a nucleotide sequence complementary to a nucleotide sequences of (a)-(d).

6. A nucleic acid vector comprising the nucleic acid sequences in any of claims 3-5.

7. A host cell containing the vector of claim 6.

8. A method for producing a sulfatase polypeptide, comprising: introducing a nucleotide sequence encoding a polypeptide sequence of claim 1 into a host cell, and culturing the host cell under conditions in which said polypeptide is expressed.

9. A method for detecting the presence of any of the polypeptides in claim 1 in a sample, said method comprising contacting said sample with an agent that specifically allows detection of the presence of the polypeptide in the sample and then detecting the presence of the polypeptide.

10. The method of claim 9, wherein said agent is capable of selective physical association with said polypeptide.

11. The method of claim 10, wherein said agent binds to said polypeptide.

12. The method of claim 11, wherein said agent is an antibody.

13. The method of claim 11, wherein said agent is a sulfated conjugate.

14. A kit comprising reagents used for the method of claim 9, wherein the reagents comprise an agent that specifically binds to said polypeptide.

5 15. A method for detecting the presence of any of the nucleic acid molecules in any of claims 3-5 in a sample, the method comprising contacting said sample with an agent that specifically allows detection of the presence of the nucleic acid molecule in the sample and then detecting the presence of the nucleic acid molecule.

10 16. The method of claim 15, wherein said method comprises contacting the sample with an oligonucleotide that hybridizes to the nucleic acid sequences under stringent conditions and determining whether the oligonucleotide binds to the nucleic acid sequence in the sample.

15 17. The method of claim 15, wherein the nucleic acid, whose presence is detected, is mRNA.

20 18. A kit comprising reagents used for the method of claim 15, wherein the reagents comprise a compound that hybridizes under stringent conditions to any of the nucleic acid molecules.

25 19. A method for identifying an agent that interacts with any of the polypeptides of claim 1 in a cell, said method comprising contacting said agent with a cell capable of allowing an interaction between said polypeptide and said agent such that said polypeptide can interact with said agent and measuring the interaction.

30 20. A method of screening a cell to identify an agent that interacts with any of the polypeptides of claim 1 in a cell, said method comprising contacting said agent with a cell capable of allowing an interaction between said polypeptide and said agent such that said polypeptide can interact with said agent, and measuring the interaction.

21. A method for identifying an agent that binds to any of the polypeptides in claim 1, said method comprising contacting the polypeptide with an agent that binds to the polypeptide and assaying the complex formed with the agent bound to the polypeptide.

22. The method of claim 21, wherein a fragment of the polypeptide is contacted.

23. A method of screening a cell to identify an agent that modulates the level or activity of any of the polypeptides of claim 1 in a cell, said method comprising: contacting said agent with a cell capable of expressing said polypeptide such that said polypeptide level or activity can be modulated in said cell by said agent and measuring said polypeptide level or activity.

24. The method of claim 19 wherein said cell is a cell from a DRG neuron, spinal cord, or brain.

25. The method of claim 23 wherein said agent increases the level or activity of said polypeptide.

26. The method of claim 23 wherein said agent decreases the level or activity of said polypeptide.

27. The method of claim 19, said method comprising: (1) exposing said agent to said polypeptide under conditions that allow said agent to interact with said polypeptide; (2) adding competing polypeptide that can interact with said agent; and (3) comparing the amount of interaction between said agent and said polypeptide to the amount of interaction in the absence of said competing polypeptide.

28. The method of claim 19 wherein said interaction is binding

A

29. The method of claim 23 wherein said agent increases interaction between said polypeptide and a target molecule for said polypeptide, said method comprising: combining said polypeptide with said agent under conditions that allow said polypeptide to interact with said target molecule; and detecting the formation of a complex between said polypeptide and said target molecule or activity of said polypeptide as a result of interaction of said polypeptide with said target molecule.

30. The method of claim 23 wherein said agent decreases interaction between said polypeptide and a target molecule for said polypeptide, said method comprising: combining said polypeptide with said agent under conditions that allow said polypeptide to interact with said target molecule; and detecting the formation of a complex between said polypeptide and said target molecule or activity of said polypeptide as a result of interaction of said polypeptide with said target molecule.

31. The method of claim 23 wherein said cell is *in vivo*.

32. The method of claim 31 wherein said cell is in a transgenic animal.

33. The method of claim 31 wherein said cell is in a non-transgenic subject.

34. The method of claim 23 wherein said cell is *in vitro*.

35. The method of claim 34 wherein said cell has been disrupted.

36. The method of claim 34 wherein said cell is in a biopsy.

37. The method of claim 35 wherein said cell is in cell culture.

38. The method of claim 37 wherein said cell is naturally-occurring or recombinant.

39. The method of claim 23 wherein said agent is selected from the group consisting of a sulfated conjugate; peptide; phosphopeptide; antibody; organic molecule; and inorganic molecule.

5 40. A method for modulating the level or activity of any of the polypeptides of claim 1, said method comprising contacting said polypeptide with an agent under conditions that allow the agent to modulate the level or activity of the polypeptide.

10 41. A method for identifying an agent that modulates the level or activity of any of the polypeptides of claim 1 in a cell, said method comprising contacting said agent with a cell capable of expressing said polypeptide such that said polypeptide level or activity can be modulated in said cell by said agent and measuring said polypeptide level or activity.

15 42. A method for identifying an agent that modulates the level or activity of any of the nucleic acid molecules of claims 3-5 in a cell, said method comprising contacting said agent with the cell capable of expressing said nucleic acid molecule such that said nucleic acid molecule level or activity can be modulated in said cell by
20 said agent and measuring said nucleic acid molecule level or activity.

43. A method of screening a cell to identify an agent that modulates the level or activity of any of the nucleic acid molecules in claims 3-5 in said cell, said method comprising contacting said agent with the cell capable of expressing said
25 nucleic acid molecule such that said nucleic acid molecule level or activity can be modulated in said cell by said agent and measuring nucleic acid molecule level or activity.

30 44. A method for identifying an agent that interacts with any of the nucleic acid molecules of claims 3-5 in a cell, said method comprising contacting said agent with a cell capable of allowing an interaction between said nucleic acid molecule and

said agent such that said nucleic acid molecule can interact with said agent in measuring the interaction.

A 5 45. A method of screening a cell to identify an agent that interacts with any of the nucleic acid molecules of claims 3-5 in a cell, said method comprising contacting said agent with a cell capable of allowing an interaction between said nucleic acid molecule and said agent such that said nucleic acid molecule can interact with said agent and measuring the interaction.

10 46. A method for modulating the level or activity of any of the nucleic acid molecules of claims 3-5, said method comprising contacting said nucleic acid molecule with an agent under conditions that allow the agent to modulate the level or activity of the nucleic acid molecule.

15 47. The method of claim 46 wherein said modulation is in cells derived from tissue selected from the group consisting of DRG neurons, spinal cord, and brain.

20 48. The method of claim 46 wherein said modulation is *in vivo*.

49. The method of claim 48 wherein said modulation is in a patient having or predisposed to having a disorder involving DRG neurons, spinal cord, or brain.

25 50. The method of claim 49 wherein said modulation is in a patient having a disorder involving pain.

30 51. A method of treating a disorder involving DRG neurons, spinal cord, or brain in a subject in need of such treatment, said method comprising administering any of the polypeptides of claim 1 to said subject in a therapeutically effective amount.

52. A method of treating a disorder involving DRG neurons, spinal cord, or brain in a subject in need of such treatment, said method comprising administering any of the polypeptides of claim 1 to said subject in therapeutically effective amounts.

53. A pharmaceutical composition containing any of the polypeptides in claim 1 in a pharmaceutically acceptable carrier.

54. A pharmaceutically acceptable composition containing any of the nucleic acid molecules of claims 3-5 in a pharmaceutically acceptable carrier.

55. A nonhuman transgenic animal wherein one or more cells of said animal contains any of the nucleic acid sequences of claims 3-5.

56. A nonhuman transgenic animal wherein one or more cells of said animal contains any of the nucleic acid sequences of claims 3-5, wherein said cell expresses any of the polypeptides of claim 1.

57. A method for producing a transgenic animal according to claim 46, said method comprising introducing any of the nucleic acid sequences of claims 3-5 into a cell, wherein said cell is present in said animal or gives rise to said animal.

58. An agent identified by any of the methods of claims 19-39

59. An agent identified by any of the methods of claims 41-45.

60. An isolated polypeptide comprising an amino acid sequence selected from the group consisting of:

(a) the amino acid sequence shown in SEQ ID NO:3;

(b) the amino acid sequence encoded by the cDNA contained in

ATCC Deposit No. _____;

(c) the amino acid sequence of an allelic variant of the amino acid sequence shown in SEQ ID NO:3;

(d) the amino acid sequence of an allelic variant of the amino acid sequence encoded by the cDNA contained in ATCC Deposit No. _____;

(e) the amino acid sequence of a sequence variant of the amino acid sequence shown in SEQ ID NO:3, wherein the sequence variant is encoded by a nucleic acid molecule hybridizing to the nucleic acid molecule shown in SEQ ID NO:4 under stringent conditions;

(f) the amino acid sequence of a sequence variant of the amino acid sequence encoded by the cDNA clone contained in ATCC Deposit No. _____, wherein the sequence variant is encoded by a nucleic acid molecule hybridizing under stringent conditions to the cDNA contained in ATCC Deposit No. _____;

(g) a fragment of the amino acid sequence shown in SEQ ID NO:3, wherein the fragment comprises at least 6 contiguous amino acids from nucleotides 510-670;

(h) a fragment of the amino acid sequence encoded by the cDNA contained in ATCC Deposit No. _____, wherein the fragment comprises at least 6 contiguous amino acids from nucleotides 510-670;

(i) the amino acid sequence of the mature sulfatase polypeptide, comprising about amino acid residues 23-871 of SEQ ID NO:3;

(j) the amino acid sequence of the mature polypeptide, comprising from about amino acid 23 to the last amino acid encoded by the cDNA clone contained in ATCC Deposit No. _____;

(k) the amino acid sequence of an epitope bearing region of a polypeptide of (a)-(j).

61. An isolated polypeptide having at least 94% or more sequence identity with the amino acid sequence of SEQ ID NO:3.

62. The polypeptide a claim 61, wherein said polypeptide has at least 97% or more sequence identity with the amino acid sequence of SEQ ID NO:3.

63. The polypeptide a claim 61, wherein said polypeptide has at least 98% or more sequence identity with the amino acid sequence of SEQ ID NO:3.

64. The polypeptide a claim 61, wherein said polypeptide has at least 99% or more sequence identity with the amino acid sequence of SEQ ID NO:3.

5 65. An isolated antibody that selectively binds to a polypeptide of claim 60.

66. An isolated nucleic acid molecule comprising a nucleotide sequence selected from the group consisting of:

- 10 (a) the nucleotide sequence shown in SEQ ID NO:4;
(b) the nucleotide sequence in the cDNA contained in ATCC Deposit No. ____;
(c) a nucleotide sequence encoding the amino acid sequence shown in SEQ ID NO:3;
(d) a nucleotide sequence encoding the amino acid sequence encoded
15 by the cDNA contained in ATCC Deposit No. ____;
(e) a nucleotide sequence encoding a polypeptide of claim 60; and
(f) a nucleotide sequence complementary to a nucleotide sequence of (a)-(e).

20 67. An isolated nucleic acid molecule comprising a nucleotide sequence selected from the group consisting of:

- (a) a nucleotide sequence encoding a variant of the amino acid sequence shown in SEQ ID NO:3, wherein said nucleotide sequence hybridizes to the nucleotide sequence shown in SEQ ID NO:4 under stringent conditions;
25 (b) a nucleotide sequence encoding a variant of the amino acid sequence encoded by the cDNA contained in ATCC Deposit No. ____, wherein the nucleic acid sequence of the sequence variant hybridizes to the cDNA contained in ATCC Deposit No. ____ under stringent conditions;
(c) a nucleotide sequence encoding the polypeptide of claim 61; and
30 (d) a nucleotide sequence complementary to either of the nucleotide sequences in (a)-(c).

68. An isolated nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of:

(a) a nucleotide sequence encoding a fragment of the amino acid sequence shown in SEQ ID NO:3, wherein the fragment comprises at least 6 contiguous amino acids from nucleotides 510-670;

(b) a nucleotide sequence encoding a fragment of the amino acid sequence encoded by the cDNA contained in ATCC Deposit No. _____, wherein the fragment comprises at least 6 contiguous amino acids from nucleotides 510-670;

(c) a nucleotide sequence comprising at least 18 consecutive nucleotides of the sequence shown in SEQ ID NO:4 from 1-670, 3008-3514, and 3998-4321;

(d) a nucleotide sequence comprising at least 18 consecutive nucleotides from 1-670, 3008-3514, and 3998-4321 of SEQ ID NO:4;

(e) a nucleotide sequence encoding residues 23-871 of the amino acid shown in SEQ ID NO:3;

(f) a nucleotide sequence encoding residues 23-871 of the amino acid encoded by the cDNA clone contained in ATCC Deposit No. _____;

(g) a nucleotide sequence complementary to a nucleotide sequence of (a)-(f).

69. A nucleic acid vector comprising a nucleic acid sequence in any of claims 66-68.

70. A host cell containing the vector of claim 69.

71. A method for producing a sulfatase polypeptide, comprising: introducing a nucleotide sequence encoding a polypeptide sequence of claim 60 into a host cell, and culturing the host cell under conditions in which said polypeptide is expressed.

72. A method for detecting the presence of any of the polypeptides in claim 60 in a sample, said method comprising contacting said sample with an agent

that specifically allows detection of the presence of the polypeptide in the sample and then detecting the presence of the polypeptide.

73. The method of claim 72, wherein said agent is capable of selective physical association with said polypeptide.

74. The method of claim 73, wherein said agent binds to said polypeptide.

75. The method of claim 74, wherein said agent is an antibody.

76. The method of claim 74, wherein said agent is a peptide substrate.

77. A kit comprising reagents used for the method of claim 72, wherein the reagents comprise an agent that specifically binds to said polypeptide.

78. A method for detecting the presence of any of the nucleic acid molecules in any of claims 66-68 in a sample, the method comprising contacting said sample with an agent that specifically allows detection of the presence of the nucleic acid molecule in the sample and then detecting the presence of the nucleic acid molecule.

79. The method of claim 78, wherein said method comprises contacting the sample with an oligonucleotide that hybridizes to the nucleic acid sequences under stringent conditions and determining whether the oligonucleotide binds to the nucleic acid sequence in the sample.

80. The method of claim 78, wherein the nucleic acid, whose presence is detected, is mRNA.

81. A kit comprising reagents used for the method of claim 78, wherein the reagents comprise a compound that hybridizes under stringent conditions to any of the nucleic acid molecules.

A

5 82. A method for identifying an agent that interacts with any of the polypeptides of claim 60 in a cell, said method comprising contacting said agent with a cell capable of allowing an interaction between said polypeptide and said agent such that said polypeptide can interact with said agent and measuring the interaction.

10 83. A method of screening a cell to identify an agent that interacts with any of the polypeptides of claim 60 in a cell, said method comprising contacting said agent with a cell capable of allowing an interaction between said polypeptide and said agent such that said polypeptide can interact with said agent, and measuring the interaction.

15 84. A method for identifying an agent that binds to any of the polypeptides in claim 60, said method comprising contacting the polypeptide with an agent that binds to the polypeptide and assaying the complex formed with the agent bound to the polypeptide.

20 85. The method of claim 84, wherein a fragment of the polypeptide is contacted.

25 86. A method of screening a cell to identify an agent that modulates the level or activity of any of the polypeptides of claim 60 in a cell, said method comprising: contacting said agent with a cell capable of expressing said polypeptide such that said polypeptide level or activity can be modulated in said cell by said agent and measuring said polypeptide level or activity.

30 87. The method of claim 86 wherein said cell is a cell from a breast or colon carcinoma.

88. The method of claim 86 wherein said agent increases the level or activity of said polypeptide.

89. The method of claim 86 wherein said agent decreases the level or activity of said polypeptide.

5 90. The method of claim 86, said method comprising: (1) exposing said agent to said polypeptide under conditions that allow said agent to interact with said polypeptide; (2) adding competing polypeptide that can interact with said agent; and (3) comparing the amount of interaction between said agent and said polypeptide to the amount of interaction in the absence of said competing polypeptide.

10 91. The method of claim 82 wherein said interaction is binding.

92. The method of claim 86 wherein said agent increases interaction between said polypeptide and a target molecule for said polypeptide, said method comprising: combining said polypeptide with said agent under conditions that allow
15 said polypeptide to interact with said target molecule; and detecting the formation of a complex between said polypeptide and said target molecule or activity of said polypeptide as a result of interaction of said polypeptide with said target molecule.

93. The method of claim 86 wherein said agent decreases interaction
20 between said polypeptide and a target molecule for said polypeptide, said method comprising: combining said polypeptide with said agent under conditions that allow said polypeptide to interact with said target molecule; and detecting the formation of a complex between said polypeptide and said target molecule or activity of said polypeptide as a result of interaction of said polypeptide with said target molecule.

25

94. The method of claim 86 wherein said cell is *in vivo*.

95. The method of claim 94 wherein said cell is in a transgenic animal.

30 96. The method of claim 94 wherein said cell is in a non-transgenic subject.

- 5
- 10
- 15
- 20
- 25
- 30
97. The method of claim 86 wherein said cell is *in vitro*.
98. The method of claim 97 wherein said cell has been disrupted.
99. The method of claim 97 wherein said cell is in a biopsy.
100. The method of claim 98 wherein said cell is in cell culture.
101. The method of claim 100 wherein said cell is naturally-occurring or recombinant.
102. The method of claim 86 wherein said agent is selected from the group consisting of a peptide; phosphopeptide; antibody; organic molecule; and inorganic molecule.
103. A method for modulating the level or activity of any of the polypeptides of claim 60, said method comprising contacting said polypeptide with an agent under conditions that allow the agent to modulate the level or activity of the polypeptide.
104. A method for identifying an agent that modulates the level or activity of any of the polypeptides of claim 60 in a cell, said method comprising contacting said agent with a cell capable of expressing said polypeptide such that said polypeptide level or activity can be modulated in said cell by said agent and measuring said polypeptide level or activity.
105. A method for identifying an agent that modulates the level or activity of any of the nucleic acid molecules of claims 66-68 in a cell, said method comprising contacting said agent with the cell capable of expressing said nucleic acid molecule such that said nucleic acid molecule level or activity can be modulated in said cell by said agent and measuring said nucleic acid molecule level or activity.

A

106. A method of screening a cell to identify an agent that modulates the level or activity of any of the nucleic acid molecules in claims 66-68 in said cell, said method comprising contacting said agent with the cell capable of expressing said nucleic acid molecule such that said nucleic acid molecule level or activity can be modulated in said cell by said agent and measuring nucleic acid molecule level or activity.

107. A method for identifying an agent that interacts with any of the nucleic acid molecules of claims 66-68 in a cell, said method comprising contacting said agent with a cell capable of allowing an interaction between said nucleic acid molecule and said agent such that said nucleic acid molecule can interact with said agent in measuring the interaction.

108. A method of screening a cell to identify an agent that interacts with any of the nucleic acid molecules of claims 66-68 in a cell, said method comprising contacting said agent with a cell capable of allowing an interaction between said nucleic acid molecule and said agent such that said nucleic acid molecule can interact with said agent and measuring the interaction.

109. A method for modulating the level or activity of any of the nucleic acid molecules of claims 66-68, said method comprising contacting said nucleic acid molecule with an agent under conditions that allow the agent to modulate the level or activity of the nucleic acid molecule.

110. The method of claim 109 wherein said modulation is in cells derived from tissue selected from the group consisting of breast and colon carcinoma.

111. The method of claim 109 wherein said modulation is *in vivo*.

112. The method of claim 111 wherein said modulation is in a patient having a disorder involving the breast or colon, or predisposed to having breast or colon carcinoma.

113. The method of claim 112 wherein said modulation is in a patient having or predisposed to having breast or colon carcinoma.

114. A method of treating a disorder involving breast or colon in a subject in need of such treatment, said method comprising administering any of the polypeptides of claim 60 to said subject in a therapeutically effective amount.

115. A method of treating breast or colon carcinoma in a subject in need of such treatment, said method comprising administering any of the polypeptides of claim 60 to said subject in therapeutically effective amounts.

116. A pharmaceutical composition containing any of the polypeptides in claim 60 in a pharmaceutically acceptable carrier.

117. A pharmaceutically acceptable composition containing any of the nucleic acid molecules of claims 66-68 in a pharmaceutically acceptable carrier.

118. A nonhuman transgenic animal wherein one or more cells of said animal contains any of the nucleic acid sequences of claims 66-68.

119. A nonhuman transgenic animal wherein one or more cells of said animal contains any of the nucleic acid sequences of claims 66-68, wherein said cell expresses any of the polypeptides of claim 60.

120. A method for producing a transgenic animal according to claim 119, said method comprising introducing any of the nucleic acid sequences of claims 66-68 into a cell, wherein said cell is present in said animal or gives rise to said animal.

121. An agent identified by any of the methods of claims 82-102.

122. An agent identified by any of the methods of claims 104-108.

123. An isolated polypeptide comprising an amino acid sequence selected from the group consisting of:

- 5
- (a) the amino acid sequence shown in SEQ ID NO:5;
 - (b) the amino acid sequence encoded by the cDNA contained in ATCC Deposit No. _____;
 - (c) the amino acid sequence of an allelic variant of the amino acid sequence shown in SEQ ID NO:5;
 - 10 (d) the amino acid sequence of an allelic variant of the amino acid sequence encoded by the cDNA contained in ATCC Deposit No. _____;
 - (e) the amino acid sequence of a sequence variant of the amino acid sequence shown in SEQ ID NO:5, wherein the sequence variant is encoded by a nucleic acid molecule hybridizing to the nucleic acid molecule shown in SEQ ID NO:6 under stringent conditions;
 - 15 (f) the amino acid sequence of a sequence variant of the amino acid sequence encoded by the cDNA clone contained in ATCC Deposit No. ____, wherein the sequence variant is encoded by a nucleic acid molecule hybridizing under stringent conditions to the cDNA contained in ATCC Deposit No. _____;
 - (g) a fragment of the amino acid sequence shown in SEQ ID NO:5, wherein the fragment comprises at least 22 contiguous amino acids;
 - 20 (h) a fragment of the amino acid sequence shown in SEQ ID NO:5, wherein said fragment comprises at least 22 contiguous amino acids.
 - (i) a fragment of the amino acid sequence encoded by the cDNA contained in ATCC Deposit No. _____, wherein the fragment comprises at least 22 contiguous amino acids;
 - 25 (j) the amino acid sequence of the mature sulfatase polypeptide, comprising about amino acid residues 24-569 of SEQ ID NO:5;
 - (k) the amino acid sequence of the mature polypeptide, comprising from about amino acid 24 to the last amino acid encoded by the cDNA clone contained in ATCC Deposit No. _____;
 - 30 (l) the amino acid sequence of an epitope bearing region of a polypeptide of (a)-(k).

124. An isolated polypeptide having at least 50% sequence identity with the amino acid sequence of SEQ ID NO:5.

125. The polypeptide a claim 124, wherein said polypeptide has at least 75% sequence identity with the amino acid sequence of SEQ ID NO:5.

126. The polypeptide a claim 124, wherein said polypeptide has at least 85% sequence identity with the amino acid sequence of SEQ ID NO:5.

127. The polypeptide a claim 124, wherein said polypeptide has at least 95% sequence identity with the amino acid sequence of SEQ ID NO:5.

128. An isolated antibody that selectively binds to a polypeptide of claim 123.

129. An isolated nucleic acid molecule comprising a nucleotide sequence selected from the group consisting of:

- (a) the nucleotide sequence shown in SEQ ID NO:6;
- (b) the nucleotide sequence in the cDNA contained in ATCC Deposit No. _____;
- (c) a nucleotide sequence encoding the amino acid sequence shown in SEQ ID NO:5;
- (d) a nucleotide sequence encoding the amino acid sequence encoded by the cDNA contained in ATCC Deposit No. _____;
- (e) a nucleotide sequence encoding a polypeptide of claim 123; and
- (f) a nucleotide sequence complementary to a nucleotide sequence of (a)-(e).

130. An isolated nucleic acid molecule comprising a nucleotide sequence selected from the group consisting of:

(a) a nucleotide sequence encoding a variant of the amino acid sequence shown in SEQ ID NO:5, wherein said nucleotide sequence hybridizes to the nucleotide sequence shown in SEQ ID NO:6 under stringent conditions;

(b) a nucleotide sequence encoding a variant of the amino acid sequence encoded by the cDNA contained in ATCC Deposit No. _____, wherein the nucleic acid sequence of the sequence variant hybridizes to the cDNA contained in ATCC Deposit No. _____ under stringent conditions;

(c) a nucleotide sequence encoding the polypeptide of claim 124; and

(d) a nucleotide sequence complementary to either of the nucleotide sequences in (a)-(c).

131. An isolated nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of:

(a) a nucleotide sequence encoding a fragment of the amino acid sequence shown in SEQ ID NO:5, wherein the fragment comprises at least 22 contiguous amino acids;

(b) a nucleotide sequence encoding a fragment of the amino acid sequence encoded by the cDNA contained in ATCC Deposit No. _____, wherein the fragment comprises at least 22 contiguous amino acids;

(c) a nucleotide sequence comprising at least 24 consecutive nucleotides of the sequence shown in SEQ ID NO:6 from 30-1900 and 1930-2420;

(d) a nucleotide sequence comprising at least 24 consecutive nucleotides from 30-1900 and 1930-2420 of SEQ ID NO:6;

(e) a nucleotide sequence encoding residues 24-569 of the amino acid shown in SEQ ID NO:5;

(f) a nucleotide sequence encoding residues 24-569 of the amino acid encoded by the cDNA clone contained in ATCC Deposit No. _____;

(g) a nucleotide sequence complementary to a nucleotide sequences of (a)-(f).

A

132. A nucleic acid vector comprising the nucleic acid sequences in any of claims 129-131.

5 133. A host cell containing the vector of claim 132.

134. A method for producing a sulfatase polypeptide, comprising: introducing a nucleotide sequence encoding a polypeptide sequence of claim 123 into a host cell, and culturing the host cell under conditions in which said polypeptide is expressed.

10 135. A method for detecting the presence of any of the polypeptides in claim 123 in a sample, said method comprising contacting said sample with an agent that specifically allows detection of the presence of the polypeptide in the sample and then detecting the presence of the polypeptide.

15 136. The method of claim 135, wherein said agent is capable of selective physical association with said polypeptide.

20 137. The method of claim 136, wherein said agent binds to said polypeptide.

138. The method of claim 137, wherein said agent is an antibody.

25 139. The method of claim 137, wherein said agent is a sulfated conjugate substrate.

140. A kit comprising reagents used for the method of claim 135, wherein the reagents comprise an agent that specifically binds to said polypeptide.

30 141. A method for detecting the presence of any of the nucleic acid molecules in any of claims 129-131 in a sample, the method comprising contacting said sample with an agent that specifically allows detection of the presence of the

nucleic acid molecule in the sample and then detecting the presence of the nucleic acid molecule.

142. The method of claim 141, wherein said method comprises contacting the sample with an oligonucleotide that hybridizes to the nucleic acid sequences under stringent conditions and determining whether the oligonucleotide binds to the nucleic acid sequence in the sample.

143. The method of claim 141, wherein the nucleic acid, whose presence is detected, is mRNA.

144. A kit comprising reagents used for the method of claim 141, wherein the reagents comprise a compound that hybridizes under stringent conditions to any of the nucleic acid molecules.

145. A method for identifying an agent that interacts with any of the polypeptides of claim 123 in a cell, said method comprising contacting said agent with a cell capable of allowing an interaction between said polypeptide and said agent such that said polypeptide can interact with said agent and measuring the interaction.

146. A method of screening a cell to identify an agent that interacts with any of the polypeptides of claim 123 in a cell, said method comprising contacting said agent with a cell capable of allowing an interaction between said polypeptide and said agent such that said polypeptide can interact with said agent, and measuring the interaction.

147. A method for identifying an agent that binds to any of the polypeptides in claim 123, said method comprising contacting the polypeptide with an agent that binds to the polypeptide and assaying the complex formed with the agent bound to the polypeptide.

A
148. The method of claim 147, wherein a fragment of the polypeptide is contacted.

149. A method of screening a cell to identify an agent that modulates the
5 level or activity of any of the polypeptides of claim 123 in a cell, said method comprising: contacting said agent with a cell capable of expressing said polypeptide such that said polypeptide level or activity can be modulated in said cell by said agent and measuring said polypeptide level or activity.

10 150. The method of claim 149 wherein said cell is a cell from a colon carcinoma.

151. The method of claim 149 wherein said agent increases the level or activity of said polypeptide.

152. The method of claim 149 wherein said agent decreases the level or activity of said polypeptide.

153. The method of claim 145, said method comprising: (1) exposing said
20 agent to said polypeptide under conditions that allow said agent to interact with said polypeptide; (2) adding competing polypeptide that can interact with said agent; and (3) comparing the amount of interaction between said agent and said polypeptide to the amount of interaction in the absence of said competing polypeptide.

25 154. The method of claim 153 wherein said interaction is binding.

155. The method of claim 149 wherein said agent increases interaction
between said polypeptide and a target molecule for said polypeptide, said method comprising: combining said polypeptide with said agent under conditions that allow
30 said polypeptide to interact with said target molecule; and detecting the formation of a complex between said polypeptide and said target molecule or activity of said polypeptide as a result of interaction of said polypeptide with said target molecule.

156. The method of claim 149 wherein said agent decreases interaction between said polypeptide and a target molecule for said polypeptide, said method comprising: combining said polypeptide with said agent under conditions that allow said polypeptide to interact with said target molecule; and detecting the formation of a complex between said polypeptide and said target molecule or activity of said polypeptide as a result of interaction of said polypeptide with said target molecule.

157. The method of claim 149 wherein said cell is *in vivo*.

158. The method of claim 157 wherein said cell is in a transgenic animal.

159. The method of claim 157 wherein said cell is in a non-transgenic subject.

160. The method of claim 149 wherein said cell is *in vitro*.

161. The method of claim 160 wherein said cell has been disrupted.

162. The method of claim 160 wherein said cell is in a biopsy.

163. The method of claim 161 wherein said cell is in cell culture.

164. The method of claim 163 wherein said cell is naturally-occurring or recombinant.

165. The method of claim 149 wherein said agent is selected from the group consisting of a sulfated conjugate; peptide; phosphopeptide; antibody; organic molecule; and inorganic molecule.

166. A method for modulating the level or activity of any of the polypeptides of claim 123, said method comprising contacting said polypeptide with

A
an agent under conditions that allow the agent to modulate the level or activity of the polypeptide.

5 167. A method for identifying an agent that modulates the level or activity of any of the polypeptides of claim 123 in a cell, said method comprising contacting said agent with a cell capable of expressing said polypeptide such that said polypeptide level or activity can be modulated in said cell by said agent and measuring said polypeptide level or activity.

10 168. A method for identifying an agent that modulates the level or activity of any of the nucleic acid molecules of claims 129-131 in a cell, said method comprising contacting said agent with the cell capable of expressing said nucleic acid molecule such that said nucleic acid molecule level or activity can be modulated in said cell by said agent and measuring said nucleic acid molecule level or activity.

15 169. A method of screening a cell to identify an agent that modulates the level or activity of any of the nucleic acid molecules in claims 129-131 in said cell, said method comprising contacting said agent with the cell capable of expressing said nucleic acid molecule such that said nucleic acid molecule level or activity can be
20 modulated in said cell by said agent and measuring nucleic acid molecule level or activity.

25 170. A method for identifying an agent that interacts with any of the nucleic acid molecules of claims 129-131 in a cell, said method comprising contacting said agent with a cell capable of allowing an interaction between said nucleic acid molecule and said agent such that said nucleic acid molecule can interact with said agent in measuring the interaction.

30 171. A method of screening a cell to identify an agent that interacts with any of the nucleic acid molecules of claims 129-131 in a cell, said method comprising contacting said agent with a cell capable of allowing an interaction between said

nucleic acid molecule and said agent such that said nucleic acid molecule can interact with said agent and measuring the interaction.

5 172. A method for modulating the level or activity of any of the nucleic acid molecules of claims 129-131, said method comprising contacting said nucleic acid molecule with an agent under conditions that allow the agent to modulate the level or activity of the nucleic acid molecule.

10 173. The method of claim 172 wherein said modulation is in cells derived from colon tissue.

174. The method of claim 172 wherein said modulation is *in vivo*.

15 175. The method of claim 174 wherein said modulation is in a patient having a disorder involving the colon.

176. The method of claim 175 wherein said modulation is in a patient having colon carcinoma.

20 177. A method of treating a disorder involving the colon in a subject in need of such treatment, said method comprising administering any of the polypeptides of claim 123 to said subject in a therapeutically effective amount.

25 178. A method of treating colon carcinoma in a subject in need of such treatment, said method comprising administering any of the polypeptides of claim 123 to said subject in therapeutically effective amounts.

30 179. A pharmaceutical composition containing any of the polypeptides in claim 123 in a pharmaceutically acceptable carrier.

180. A pharmaceutically acceptable composition containing any of the nucleic acid molecules of claims 129-131 in a pharmaceutically acceptable carrier.

181. A nonhuman transgenic animal wherein one or more cells of said animal contains any of the nucleic acid sequences of claims 129-131.

5 182. A nonhuman transgenic animal wherein one or more cells of said animal contains any of the nucleic acid sequences of claims 129-131, wherein said cell expresses any of the polypeptides of claim 123.

10 183. A method for producing a transgenic animal according to claim 182, said method comprising introducing any of the nucleic acid sequences of claims 129-131 into a cell, wherein said cell is present in said animal or gives rise to said animal.

184. An agent identified by any of the methods of claims 145-165.

15 185. An agent identified by any of the methods of claims 167-171.

186. An isolated polypeptide comprising an amino acid sequence selected from the group consisting of:

- 20 (a) the amino acid sequence shown in SEQ ID NO:7;
(b) the amino acid sequence encoded by the cDNA contained in ATCC Deposit No. _____;
(c) the amino acid sequence of an allelic variant of the amino acid sequence shown in SEQ ID NO:7;
(d) the amino acid sequence of an allelic variant of the amino acid
25 sequence encoded by the cDNA contained in ATCC Deposit No. _____;
(e) the amino acid sequence of a sequence variant of the amino acid sequence shown in SEQ ID NO:7, wherein the sequence variant is encoded by a nucleic acid molecule hybridizing to the nucleic acid molecule shown in SEQ ID NO:8 under stringent conditions;
30 (f) the amino acid sequence of a sequence variant of the amino acid sequence encoded by the cDNA clone contained in ATCC Deposit No. _____, wherein the

sequence variant is encoded by a nucleic acid molecule hybridizing under stringent conditions to the cDNA contained in ATCC Deposit No. _____;

(g) a fragment of the amino acid sequence shown in SEQ ID NO:7, wherein the fragment comprises at least 11 contiguous amino acids;

(h) a fragment of the amino acid sequence shown in SEQ ID NO:7, wherein said fragment comprises at least 11 contiguous amino acids.

(i) a fragment of the amino acid sequence encoded by the cDNA contained in ATCC Deposit No. _____, wherein the fragment comprises at least 11 contiguous amino acids;

(j) the amino acid sequence of the mature sulfatase polypeptide, comprising about amino acid residues 50-550 of SEQ ID NO:7;

(k) the amino acid sequence of the mature polypeptide, comprising from about amino acid 50 to the last amino acid encoded by the cDNA clone contained in ATCC Deposit No. _____;

(l) the amino acid sequence of an epitope bearing region of a polypeptide of (a)-(k).

187. An isolated polypeptide having at least 50% sequence identity with the amino acid sequence of SEQ ID NO:7.

188. The polypeptide a claim 187, wherein said polypeptide has at least 75% sequence identity with the amino acid sequence of SEQ ID NO:7.

189. The polypeptide a claim 187, wherein said polypeptide has at least 85% sequence identity with the amino acid sequence of SEQ ID NO:7.

190. The polypeptide a claim 187, wherein said polypeptide has at least 95% sequence identity with the amino acid sequence of SEQ ID NO:7.

191. An isolated antibody that selectively binds to a polypeptide of claim 186.

192. An isolated nucleic acid molecule comprising a nucleotide sequence selected from the group consisting of:

- 5
- (a) the nucleotide sequence shown in SEQ ID NO:8;
- (b) the nucleotide sequence in the cDNA contained in ATCC Deposit No. ____;
- (c) a nucleotide sequence encoding the amino acid sequence shown in SEQ ID NO:7;
- (d) a nucleotide sequence encoding the amino acid sequence encoded by the cDNA contained in ATCC Deposit No. ____;
- 10 (e) a nucleotide sequence encoding a polypeptide of claim 186; and
- (f) a nucleotide sequence complementary to a nucleotide sequence of (a)-(e).

193. An isolated nucleic acid molecule comprising a nucleotide sequence selected from the group consisting of:

- 15 (a) a nucleotide sequence encoding a variant of the amino acid sequence shown in SEQ ID NO:7, wherein said nucleotide sequence hybridizes to the nucleotide sequence shown in SEQ ID NO:8 under stringent conditions;
- (b) a nucleotide sequence encoding a variant of the amino acid sequence encoded by the cDNA contained in ATCC Deposit No. ____, wherein the nucleic acid sequence of the sequence variant hybridizes to the cDNA contained in ATCC Deposit No. ____ under stringent conditions;
- 20 (c) a nucleotide sequence encoding the polypeptide of claim 187; and
- (d) a nucleotide sequence complementary to either of the nucleotide sequences in (a)-(c).
- 25

194. An isolated nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of:

- 30 (a) a nucleotide sequence encoding a fragment of the amino acid sequence shown in SEQ ID NO:7, wherein the fragment comprises at least 11 contiguous amino acids;

(b) a nucleotide sequence encoding a fragment of the amino acid sequence encoded by the cDNA contained in ATCC Deposit No. _____, wherein the fragment comprises at least 11 contiguous amino acids;

(c) a nucleotide sequence comprising at least 17 consecutive nucleotides of the sequence shown in SEQ ID NO:8 from 272-751, 1074-1264, and 20 from 1264-1551;

(d) a nucleotide sequence comprising at least 17 consecutive nucleotides from 272-751, 1074-1264, and 20 from 1264-1551 of SEQ ID NO:8;

(e) a nucleotide sequence encoding residues 50-550 of the amino acid shown in SEQ ID NO:7;

(f) a nucleotide sequence encoding residues 50-550 of the amino acid encoded by the cDNA clone contained in ATCC Deposit No. _____;

(g) a nucleotide sequence complementary to a nucleotide sequences of (a)-(f).

195. A nucleic acid vector comprising the nucleic acid sequences in any of claims 193-194.

196. A host cell containing the vector of claim 195.

197. A method for producing a sulfatase polypeptide, comprising: introducing a nucleotide sequence encoding a polypeptide sequence of claim 186 into a host cell, and culturing the host cell under conditions in which said polypeptide is expressed.

198. A method for detecting the presence of any of the polypeptides in claim 186 in a sample, said method comprising contacting said sample with an agent that specifically allows detection of the presence of the polypeptide in the sample and then detecting the presence of the polypeptide.

199. The method of claim 198, wherein said agent is capable of selective physical association with said polypeptide.

200. The method of claim 199, wherein said agent binds to said polypeptide.

201. The method of claim 200, wherein said agent is an antibody.

202. The method of claim 200, wherein said agent is a peptide substrate.

203. A kit comprising reagents used for the method of claim 199, wherein the reagents comprise an agent that specifically binds to said polypeptide.

204. A method for detecting the presence of any of the nucleic acid molecules in any of claims 193-195 in a sample, the method comprising contacting said sample with an agent that specifically allows detection of the presence of the nucleic acid molecule in the sample and then detecting the presence of the nucleic acid molecule.

205. The method of claim 204, wherein said method comprises contacting the sample with an oligonucleotide that hybridizes to the nucleic acid sequences under stringent conditions and determining whether the oligonucleotide binds to the nucleic acid sequence in the sample.

206. The method of claim 204, wherein the nucleic acid, whose presence is detected, is mRNA.

207. A kit comprising reagents used for the method of claim 204, wherein the reagents comprise a compound that hybridizes under stringent conditions to any of the nucleic acid molecules.

208. A method for identifying an agent that interacts with any of the polypeptides of claim 186 in a cell, said method comprising contacting said agent with a cell capable of allowing an interaction between said polypeptide and said agent such that said polypeptide can interact with said agent and measuring the interaction.

209. A method of screening a cell to identify an agent that interacts with any of the polypeptides of claim 186 in a cell, said method comprising contacting said agent with a cell capable of allowing an interaction between said polypeptide and said agent such that said polypeptide can interact with said agent, and measuring the interaction.

210. A method for identifying an agent that binds to any of the polypeptides in claim 186, said method comprising contacting the polypeptide with an agent that binds to the polypeptide and assaying the complex formed with the agent bound to the polypeptide.

211. The method of claim 210, wherein a fragment of the polypeptide is contacted.

212. A method of screening a cell to identify an agent that modulates the level or activity of any of the polypeptides of claim 186 in a cell, said method comprising: contacting said agent with a cell capable of expressing said polypeptide such that said polypeptide level or activity can be modulated in said cell by said agent and measuring said polypeptide level or activity.

213. The method of claim 212 wherein said agent increases the level or activity of said polypeptide.

214. The method of claim 212 wherein said agent decreases the level or activity of said polypeptide.

215. The method of claim 208, said method comprising: (1) exposing said agent to said polypeptide under conditions that allow said agent to interact with said polypeptide; (2) adding competing polypeptide that can interact with said agent; and (3) comparing the amount of interaction between said agent and said polypeptide to the amount of interaction in the absence of said competing polypeptide.

216. The method of claim 208 wherein said interaction is binding.

5 217. The method of claim 212 wherein said agent increases interaction between said polypeptide and a target molecule for said polypeptide, said method comprising: combining said polypeptide with said agent under conditions that allow said polypeptide to interact with said target molecule; and detecting the formation of a complex between said polypeptide and said target molecule or activity of said polypeptide as a result of interaction of said polypeptide with said target molecule.

10 218. The method of claim 212 wherein said agent decreases interaction between said polypeptide and a target molecule for said polypeptide, said method comprising: combining said polypeptide with said agent under conditions that allow said polypeptide to interact with said target molecule; and detecting the formation of a
15 complex between said polypeptide and said target molecule or activity of said polypeptide as a result of interaction of said polypeptide with said target molecule.

219. The method of claim 212 wherein said cell is *in vivo*.

20 220. The method of claim 219 wherein said cell is in a transgenic animal.

221. The method of claim 219 wherein said cell is in a non-transgenic subject.

25 222. The method of claim 212 wherein said cell is *in vitro*.

223. The method of claim 222 wherein said cell has been disrupted.

224. The method of claim 222 wherein said cell is in a biopsy.

30 225. The method of claim 223 wherein said cell is in cell culture.

226. The method of claim 225 wherein said cell is naturally-occurring or recombinant.

A 5 227. The method of claim 212 wherein said agent is selected from the group consisting of a sulfated conjugate; peptide; phosphopeptide; antibody; organic molecule; and inorganic molecule.

10 228. A method for modulating the level or activity of any of the polypeptides of claim 186, said method comprising contacting said polypeptide with an agent under conditions that allow the agent to modulate the level or activity of the polypeptide.

15 229. A method for identifying an agent that modulates the level or activity of any of the polypeptides of claim 186 in a cell, said method comprising contacting said agent with a cell capable of expressing said polypeptide such that said polypeptide level or activity can be modulated in said cell by said agent and measuring said polypeptide level or activity.

20 230. A method for identifying an agent that modulates the level or activity of any of the nucleic acid molecules of claims 193-195 in a cell, said method comprising contacting said agent with the cell capable of expressing said nucleic acid molecule such that said nucleic acid molecule level or activity can be modulated in said cell by said agent and measuring said nucleic acid molecule level or activity.

25 231. A method of screening a cell to identify an agent that modulates the level or activity of any of the nucleic acid molecules in claims 193-195 in said cell, said method comprising contacting said agent with the cell capable of expressing said nucleic acid molecule such that said nucleic acid molecule level or activity can be modulated in said cell by said agent and measuring nucleic acid molecule level or
30 activity.

232. A method for identifying an agent that interacts with any of the nucleic acid molecules of claims 193-195 in a cell, said method comprising contacting said agent with a cell capable of allowing an interaction between said nucleic acid molecule and said agent such that said nucleic acid molecule can interact with said agent in measuring the interaction.

233. A method of screening a cell to identify an agent that interacts with any of the nucleic acid molecules of claims 193-195 in a cell, said method comprising contacting said agent with a cell capable of allowing an interaction between said nucleic acid molecule and said agent such that said nucleic acid molecule can interact with said agent and measuring the interaction.

234. A method for modulating the level or activity of any of the nucleic acid molecules of claims 193-195, said method comprising contacting said nucleic acid molecule with an agent under conditions that allow the agent to modulate the level or activity of the nucleic acid molecule.

235. The method of claim 234 wherein said modulation is *in vivo*.

236. A pharmaceutical composition containing any of the polypeptides in claim 186 in a pharmaceutically acceptable carrier.

237. A pharmaceutically acceptable composition containing any of the nucleic acid molecules of claims 193-195 in a pharmaceutically acceptable carrier.

238. A nonhuman transgenic animal wherein one or more cells of said animal contains any of the nucleic acid sequences of claims 193-195.

239. A nonhuman transgenic animal wherein one or more cells of said animal contains any of the nucleic acid sequences of claims 193-195, wherein said cell expresses any of the polypeptides of claim 186.

240. A method for producing a transgenic animal according to claim 239, said method comprising introducing any of the nucleic acid sequences of claims 193-195 into a cell, wherein said cell is present in said animal or gives rise to said animal.

5 241. An agent identified by any of the methods of claims 208-227.

242. An agent identified by any of the methods of claims 229-233.

10

JPB
A1